

What is claimed is:

1. An apparatus for controlling a light assembly, the apparatus comprising:
a lamp unit having a load;
a current restricting unit that adjusts the load on the lamp unit, wherein the current
5 restricting unit is coupled to the lamp unit;
a current sensing unit that determines a total current flow through the lamp unit, wherein
the current sensing unit is coupled to the current restricting unit; and
a current control unit that adjusts a current supply to the lamp unit based on the total
current flow.

10 2. The apparatus of claim 1, wherein the current restricting unit comprises:
a comparing block that compares a voltage at an output end of the lamp unit against a
reference voltage; and
a selection block that directs a current from the lamp unit to the comparing block,
15 wherein the selection block is coupled to the comparing block and the current sensing block.

3. The apparatus of claim 2, wherein the selection block directs the current from the
lamp unit to at least one of the comparing block and the current sensing block, depending on at
least one of a magnitude of the current from the lamp output and a time period during which the
20 magnitude is sustained.

4. The apparatus of claim 2, wherein the selection block comprises:
a switching element; and
a current restricting resistor connected to the lamp output in parallel with the switching
25 element, the switching element configured to turn on and off based on a signal from the
comparing block, such that current flows to the current sensing unit when the switching element
is turned on.

5. The apparatus of claim 2, wherein the selection block comprises:
30 a current restricting resistor; and

a transistor having a collector, a base, and an emitter, wherein the current resisting resistor and the transistor are coupled to the lamp unit in parallel, such that the collector is coupled to the lamp unit, the base is coupled to the comparing block, and the emitter is coupled to the current sensing unit.

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6. The apparatus of claim 5, wherein the comparing block comprises a comparator coupled to the lamp, the comparator having a first input, a second input, and a comparator output, wherein the reference voltage is coupled to the first input and the comparator output is coupled to the base of the transistor, such that a state of the transistor depends on a relative value
10 of the voltage at the first input and the second input.

7. The apparatus of claim 6 further comprising a voltage divider that generates the reference voltage at the first input of the comparator.

15 8. The apparatus of claim 6 further comprising an RC circuit coupled to the second input.

9. The apparatus of claim 6 further comprising a feedback loop connecting the comparator output to the second input, the feedback loop comprising a feedback resistor.
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10. The apparatus of claim 9 further comprising an additional resistor connected between the feedback loop and a node having a predetermined voltage.

11. The apparatus of claim 6, wherein the comparator is a non-inverting hysteresis
25 comparator.

12. The apparatus of claim 1, wherein the current sensing unit comprises a diode unit coupled to the lamp unit for generating a half-wave rectified voltage at an output of the lamp unit and forwarding the half-wave-rectified voltage to the selection block.
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13. The apparatus of claim 12, wherein the diode unit comprises a first diode and a second diode that are connected to the lamp unit in parallel, the first diode allowing current to flow into the lamp unit and the second diode allowing current to flow out of the lamp unit and to the selection block.

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14. The apparatus of claim 1, wherein:
the lamp unit includes a first lamp and a second lamp coupled in a parallel configuration,
the current restricting unit includes a first current restricting subunit that is coupled to the first lamp and a second current restricting subunit that is coupled to the second lamp, and
10 the current sensing unit includes a first current sensing subunit that is coupled to the first lamp and a second current sensing subunit that is coupled to the second lamp, the apparatus further comprising:

a first capacitor coupled to an input to one of the lamps; and
a second capacitor coupled to an input to another one of the lamps, wherein the first
15 capacitor and the second capacitor control magnitudes of current flowing into the respective lamps.

15. The apparatus of claim 14, wherein the first current restricting subunit includes a first switching element and the second current restricting subunit includes a second switching
20 element, further comprising:

a first sensing resistor coupled to the first switching element and a node of a predetermined voltage;
a second sensing resistor coupled to the second switching element and the node of the predetermined voltage;
25 a first summing resistor coupled to the first switching element and the current control unit; and
a second summing resistor coupled to the second switching element and the current control unit, such that the current control unit receives a sum of current from the first switching element and current from the second switching element, the sum indicating the total current flow
30 through the lamp unit.

16. The apparatus of claim 15, wherein the current controlling unit comprises an inverter that controls the current supply to the lamp input.

17. The apparatus of claim 16, wherein the current controlling unit further comprises an inverter controller that generates an adjusted current supply signal based on the total current flow from the first and the second summing resistors, and forwarding the adjusted current supply signal to the inverter.

18. The apparatus of claim 17, wherein the inverter controller generates the adjusted current supply signal based on maintaining a substantially constant current flowing through the first and the second lamps.

19. The apparatus of claim 1, wherein the selection block further comprises a current restricting resistor coupled to the lamp output and the second input of the comparator.

20. The apparatus of claim 1, wherein the selection block increases the load on the lamp unit in response to the total current flow's exceeding a predetermined magnitude for a predetermined time period.

21. An apparatus for controlling a light assembly, the apparatus comprising:
a first lamp and a second lamp coupled in a parallel configuration;
a first current restricting subunit that is coupled to the first lamp and a second current restricting subunit that is coupled to the second lamp;
a first current sensing subunit that is coupled to the first lamp for determining a first current flow through the first lamp and a second current sensing subunit that is coupled to the second lamp for determining a second current flow through the second lamp; and
a current control unit that sums the first current flow and the second current flow to generate a total current flow, and adjusts a current supply to the first lamp and the second lamp based on the total current flow.

22. The apparatus of claim 21, wherein

the first current sensing subunit comprises:

a first comparing unit that compares a voltage at an output end of the first lamp against a reference voltage, the first comparing unit including a first comparator having a first inverting input, a first noninverting input, and a first comparator output; and
a first selection block coupled to the first comparing unit; and

the second current sensing subunit comprises:

a second comparing unit that compares a voltage at an output end of the second lamp against the reference voltage, the second comparing unit including a second comparator having a second inverting input, a second noninverting input, and a second comparator output; and
a second selection block coupled to the second comparing unit.

23. The apparatus of claim 22, wherein

the first selection block comprises a first switching element that is configured to adjust a load on the first lamp in response to the first comparator output; and

the second selection block comprises a second switching element that is configured to adjust a load on the second lamp in response to the second comparator output.

24. The apparatus of claim 22, wherein the reference voltage is coupled to the first inverting input and the second inverting input,

the first comparing unit further comprising:

a first RC circuit coupled to the first noninverting input; and

a first feedback loop connecting the first comparator output to the first noninverting input, the first feedback loop including a first feedback resistor; and

the second comparing unit further comprising:

a second RC circuit coupled to the second noninverting input; and

a second feedback loop connecting the second comparator output to the second noninverting input, the second feedback loop including a second feedback resistor.

25. The apparatus of claim 21, wherein the first selection block is coupled to a first summing resistor and the second selection block is coupled to a second summing resistor, wherein the first summing resistor and the second summing resistor are coupled to a feedback
5 loop to the current control unit.

26. A method of controlling a light assembly, the method comprising:
monitoring a current output from each of a plurality of lamps;
increasing a load on one of the lamps upon detecting a current output exceeding a
10 predetermined magnitude for at least a predetermined time period;
summing the current output from each of the plurality of lamps to determine a total current flow through the lamps; and
adjusting current input to the lamps based on the total current flow.

15 27. A display apparatus comprising:
a liquid crystal panel assembly; and
a light assembly coupled to the liquid crystal panel assembly, the light assembly including:
a lamp unit;
20 a current restricting unit that adjusts a load on the lamp unit, wherein the current restricting unit is coupled to the lamp unit;
a current sensing unit that determines a total current flow through the lamp unit, wherein the current sensing unit is coupled to the current restricting unit; and
a current control unit that adjusts a current supply to the lamp unit based on the
25 total current flow.